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COST OF ETHANOL TAX INCENTIVES in 2000

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Introduction

The possibility that Congress may pass a comprehensive energy bill this year that includes a renewable fuels standard (RFS) for ethanol has sparked interest in the cost of the ethanol incentives. The major incentive is the Federal motor-fuels excise tax exemption, equivalent to 54 cents per gallon of ethanol in 2000. Thereafter, the incentives on a gallon of ethanol basis are 53 cents in 2001, 52 cents in 2003 and 2004, and to 51 cents for 2005 through 2007. The tax incentives also include a small producer income tax credit of 10 cents per gallon. The Federal incentives expire in 2007, but the Bush energy plan calls for their extension. Some states also have enacted their own incentives to spur in-state ethanol production or use.

The true cost of the ethanol tax incentives to government is the change in the tax revenues that occur. The incentives are revenues forgone or moneys expended by the government. However, they generate additional tax revenues for several reasons. First, there are some unique fiscal reasons that produce additional tax revenues. Second, ethanol activity generates income that is subject to income taxes. Third, ethanol production increases the demand for corn, and hence its market price, which decreases farm support outlays. These factors are discussed below.

Nominal Amount of Ethanol Incentives in 2000

Table 1 shows the total U.S. ethanol, production, consumption, and plant capacity in 2000.

Table 1. Ethanol Capacity, Production, and Consumption in 2000

	Million Gallons	Source
Production	1,630	Energy Information Administration
Consumption in Motor Fuel	1,480	Department of Transportation
Plant Capacity	1,850	Renewable Fuels Association

Production numbers are typically larger than consumption numbers for several reasons. Some ethanol is used for industrial applications and some for distilled spirits. Ethanol production occurs several months before consumption, so the two data series do not line up. As ethanol production is increasing, the production series should lead the consumption series. End-of-year inventory levels can also contribute to differences between production and consumption. The production numbers are from the Energy Information Administration (EIA) "Monthly Oxygenate Telephone Report". Consumption numbers are derived from motor fuel excise tax filings.

Table 2 summarizes the nominal amount of the ethanol tax incentives in 2000 for both the Federal and state programs.

Table 2. Nominal Amount of the Ethanol Tax Incentives in 2000		
	Million Dollars	Source
Federal Excise Tax Exemption	782	Departments of Transportation and Treasury
Federal Income Tax Credit	15	Treasury
Total Federal Incentives	**797**	
State Excise and Sales Tax Exemptions	27	See Appendix
State Producer Incentives	34	See Appendix
Total State Incentives	**61**	
Total Federal and State Incentive	**858**	

The Federal income tax credit includes credits for the small amount of E85 sales and the small-producer's credit. Because of Federal tax law restrictions, many small co-ops were not able to take advantage of the small producer's tax credits. Legislation has been introduced to allow co-ops to pass the tax credits through to their members, but other technical tax hurdles still remain, and the magnitude of the income tax credits claimed is expected to remain relatively small compared with the excise tax exemptions.

All the state tax incentives are less than 8 percent of the Federal tax incentives. The impetus of states to continue ethanol incentive programs may diminish if an RFS is enacted, since an RFS would guarantee a significant increase of the ethanol market. Whether an RFS will affect the continuance of the Federal ethanol incentives is unknown, but the incentive has proved resilient in the past due to political pressure from the farm states. One possibility is that the incentives may be renewed, but at a lower rate.

Net Costs of the Incentives Due to Fiscal Adjustments

The nominal value of the ethanol incentives overstates its true cost to the government for two purely fiscal reasons. First, Internal Revenue Service (IRS) regulations treat the ethanol incentive as gross income, and it is taxed at the taxpayer's marginal tax rate. Second, liquid motor fuel taxes are assessed volumetrically, but ethanol has only about two-thirds the energy content of gasoline for an equal volume. For the same miles driven, approximately 50 percent more ethanol is used by volume and, consequently, the tax receipts are 50 percent greater. This applies to both Federal and state taxes. Table 3 summarizes the fiscal adjustments that must be made to determine the true impact of the incentive on the government's tax revenues. The table shows that on a fiscal basis alone, the cost of the 54-cent per gallon Federal tax incentive to the

Federal government is about 34 cents per gallon, or about 63% of the nominal value of the incentive. The combined cost to the Federal and state governments is only 25 cents per gallon, or less than half the incentive value. For a complete discussion of this topic, see David Andress, *Ethanol Tax Incentives and Issues*, David Andress & Associates, Inc., April 1998, http://www.ott.doe.gov/pdfs/eth_tax.pdf .

Table 3. Fiscal Adjustments and Net Cost to Government of the Federal Ethanol Subsidies (Cents per Gallon)	
Federal Incentive (Excise Tax Exemption or Income tax Credit)	**54**
BTU Adjustment for Federal Excise Tax	6.1
Federal Income Tax Adjustment (0.25 Tax Rate Applied to Incentive[1])	13.5
Total Federal Adjustment	19.6
Subsidy Net of Federal Adjustments	**34.4**
BTU Adjustment for Median State Motor Fuel Tax (20 cents per gallon)	6.7
Typical State Income Tax Adjustment (0.05 Tax Rate Applied to Incentive[2])	2.7
Total State Adjustment	**9.4**
Subsidy Net of Federal and State Adjustments (Does Not Include State Incentives)	**25.0**

[1] The Joint Committee on Taxation and the Treasury have adopted a convention to estimate the gross loss (gain) in Federal income tax revenues as 25 percent of the excise tax imposed (foregone). The 25 percent figure represents the average marginal income tax rate.
[2]Represents the average state marginal tax rate.

Applying the fiscal adjustments to the Federal ethanol incentives of 797 million dollars in 2000, results in a net cost to the Federal government of 508 million dollars and additional revenues to the state governments of 139 million dollars (Table 4). The total cost of the Federal incentive to the combined Federal and state governments is 369 million dollars.

Table 4. Nominal and Fiscal-Adjusted Costs for the Federal Ethanol Incentives		
	Million Dollars	**Percent**
Nominal Federal Incentive (Excise Tax Exemption or Income tax Credit)	**797**	**100%**
BTU Adjustment for Federal Excise Tax	90	11%
Federal Income Tax Adjustment (0.25 Tax Rate Applied to Incentive)	199	25%
Total Federal Adjustment	289	36%
Subsidy Net of Federal Adjustments	**508**	**64%**
BTU Adjustment for Median State Motor Fuel Tax (20 cents per gallon)	99	12%
Typical State Income Tax Adjustment (0.05 Tax Rate Applied to Incentive)	40	5%
Total State Adjustment	**139**	**17%**
Subsidy Net of Federal and State Adjustments (Does Not Include State Incentives)	**369**	**46%**

State subsidies fall into two categories: (1) motor fuels excise or sales tax exemptions and (2) producer credits. The net cost to the federal and state governments for the first category is similar to the treatment of the Federal tax incentives shown in the Table 3. Excise and sales tax exemptions are foregone deductions and hence subject to income taxes at the combined Federal and state marginal rate of 30 percent (25 percent + 5 percent). The BTU adjustment has already been accounted for in the adjustment to the Federal tax incentives. So from a fiscal perspective, the net combined cost to the Federal and state governments of the state incentives in the first category is 70 percent of their nominal value. The net cost of the second category to the Federal and state governments depends on the specific tax treatment of the producer credits.

Expiration dates of state incentives vary, and their extensions have been less resilient than that of the Federal incentives. The aim of the state incentives has typically been to create additional demand for corn and to establish value-added industries. States normally conduct economic analyses to justify the incentives. For example, Minnesota has a 20-cent per gallon producer incentive with an overall cap of $30 million per year. The justification for the incentive was based on an economic analysis that concluded an in-state ethanol industry will contribute more than $350 million in net annual benefit to the state. State ethanol incentives are summarized in the Appendix.

Other Factors That Reduce the Cost of the Ethanol Tax Incentives to the Government

The production of ethanol results in taxable income from producer and blender profits, wages paid to employees, equipment purchases, feedstock purchases, etc. In addition, ethanol displaces oil, much of which is imported and is not subject to U.S. income taxes. Quantifying the additional tax revenues is difficult and involves making a number of assumptions about economic variables.

Another, a very tangible benefit is the reduction in loan deficiency payments by the Federal government to farmers. The government pays farmers the difference between the Loan Deficiency Payment (LDP) rate (the term used for the price support level) and the market price of the

commodity. For the 2000 crop year, the loan deficiency and price support payments for corn were about 2.6 billion dollars for a total U.S. corn production of 9.97 billion bushels.

A United States Department of Agriculture (USDA) analysis estimated that ethanol production increased corn prices by 20 to 28 cents per bushel. A July 22, 2001, New York Times article said the increase was 30 cents per bushel ("Support Grows for Corn-Based Fuel Despite Critics", By Lizette Alvarez with David Barboza). This means the increase in farmer receipts from corn attributable to ethanol production was between 2 and 3 billion dollars, which represents a direct saving to corn-support payments. That is, without the ethanol production the corn support payments would have been between 4.6 and 5.6 billion dollars. The decrease in loan deficiency payments should be compared with the nominal 797-million-dollar Federal tax incentives or the fiscally adjusted value of 508 million dollars (64% of nominal value for the Federal government).

The comparison in the above paragraph suggests that the benefits from reduced farm subsidy payments may outweigh the cost of the ethanol incentives. Accurately quantify the savings to the government from reduced loan deficiency payments, however, is difficult. For example, higher corn prices may have a negative impact on income tax receipts from non-farm sectors. On the other hand, ethanol production activities will have a positive impact on income tax receipts. Another factor is that the additional corn production can affect the production of other agricultural crops, primarily soy, and impact support payments related to these crops. Nonetheless, even if one conservatively estimated the savings in loan deficiency payments at only about one-half of the lower bound of the 2 to 3 billion dollar range, or 1 billion dollars, they would still outweigh the cost of the Federal ethanol incentives.

Care must be taken when extrapolating the above estimate to future years. To quantify the reduction in loan deficiency payments, one also has to look at the relationship between what price of corn would be without any ethanol production and the LDP rate, which USDA sets annually. In addition, as ethanol production increases, the additional cents per bushel of corn attributable to ethanol production will increase. Projecting these economic variables is very speculative, but what is not speculative is the long and continuous history of Federal support for the agricultural sector and that the ethanol subsidies are a very important part of the nation's agricultural support policies.

Highway Trust Fund

The above calculations show the net cost of the ethanol tax incentives on Federal government revenues. However, most of the motor fuel excise taxes go directly to the Highway Trust Fund (HTF), while the income taxes received on the excise tax exemptions go to the General Fund. Likewise any Loan-Deficiency-Program savings and income taxes that result from ethanol production activities accrue to the General Fund. The prospect of significantly increasing the consumption of ethanol with an RFS has raised concerns about the impact on the HTF.

The Federal excise tax for gasoline is 18.4 cents per gallon. Of that, 18.3 cents is allocated to the HTF and 0.1 cents is allocated to the Leaking Underground Storage Trust (LUST) fund. The

allocation of entire 18.3 cents to the HTF has not always been the case. Prior to 1997, 4.3 cents of the excise tax was allocated to the General Fund.

A taxpayer can claim either the excise tax exemption or the income tax credit. The income tax credit reduces payments to the General Fund; it does not affect motor fuels excise taxes. In fact, when the income tax credit is claimed, the HTF benefits from the ethanol BTU adjustment. However, the excise tax exemption accounts for the bulk of the Federal ethanol incentives.

The allocation of the excise tax for gasohol has some special provisions. Where the alcohol source is not natural gas or a petroleum product, the General Fund receives 2.5 cents per gallon for less than 10-percent gasohol and 3.1 cents per gallon for 10-percent and greater gasohol. Table 5 summarizes the excise tax allocations for gasoline and gasohol.

Table 5. Allocation of Excise Tax (cents per gallon)

	Excise Tax (With Exemption Accounted for)	Highway Trust Fund	General Fund	Leaking Underground Storage Trust
Gasoline	18.4	18.3	0.0	0.1
Gasohol With 10% or More Ethanol	13.0	9.8	3.1	0.1
Gasohol With 7.7% Ethanol	14.24	11.64	2.5	0.1
Gasohol With 5.7% Ethanol	15.32	12.72	2.5	0.1

Table 6 shows the total ethanol and gasohol consumption for 2000.

Table 6. Ethanol and Gasohol Consumption for 2000 (million gallons)

Total Ethanol Used in Gasohol	1,476
10-percent Gasohol	10,384
Less than 10-percent Gasohol	5,591
Total Gasohol	16,334

To calculate the impact on the HTF due to the ethanol excise tax exemption, the extra excise taxes collected because of the BTU adjustment also has to be accounted for. On a per gallon of ethanol basis, the equivalent excise tax exemption is 54 cents and the BTU adjustment is 6.1 cents per gallon, or the net impact on the HTF is 47.9 cents per gallon. Table 7 shows the reductions in the HTF due to the ethanol excise tax exemptions and the transfers to the General Fund.

Table 7 Reductions in Contributions to the Highway Trust for 2000 (million dollars)	
Reductions Due to Excise Tax Exemption	
Ethanol Excise Tax Exemption Without BTU Adjustment (54 c/g)	797
Ethanol Excise Tax Exemption With BTU Adjustment (47.9 c/g)	**707**
Allocation to General Fund	
10-percent Gasohol	322
Less than 10-percent Gasohol	149
Total Increase in the General Fund	**471**
Total Reduction to Highway Trust Fund (With BTU Adjustment)	**1,178**

Several bills have been introduced in Congress to repeal the allocation of part of the excise tax to the General Fund for alcohol fuels.

Other Ethanol Incentives

At times, Federal and state governments establish additional, limited-duration programs to promote ethanol production. Typically, these programs have other objectives as well. For example, the USDA Bioenergy Program promotes new ethanol production, but its primary purpose is to provide agricultural support. The Program is in effect for government fiscal years 2001 and 2002. The USDA will pay eligible producers up to $150 million per year for each of those years. Payments to each producer are capped at $7.5 million per year. USDA will base payments on the increase in bioenergy production compared to the previous year's production. Payments are structured to encourage participation of producers with less than 65 million gallons of annual production capacity as follows:

- Producers with total annual production of less than 65 million gallons are reimbursed 1 feedstock unit for every 2.5 used for increased production.

- Producers with total annual production of 65 million gallons or more are reimbursed 1 feedstock unit for every 3.5 used for increased production.

For FY 2001, payments for the USDA Bioenergy Program were about $40 million out of a possible $150 million.

Appendix
State Ethanol Tax Incentives

State Motor Fuel Excise Tax and Retail Sales Tax Exemptions		
State	**Exemption for Gasohol (Cents per Gallon of)**	**Equivalent Exemption for Ethanol (Cents per Gallon)**
Excise Tax Exemptions for Gasohol		
Alaska	6 cents per gallon for E10 and higher. Applies only to Anchorage and only during winter months. Eight cents per gallon when lignocellulosic ethanol is used. Applies year round; valid only for first five years of a facility's production. Expires June 30, 2004	60 - 80
Connecticut	1.0	10
Idaho	2.5	25
Iowa	1.0 Expires 2007	10
South Dakota	2.0	20
Excise Tax Exemptions for E85		
California	One-half of the gasoline fuel excise tax credit for E85. Neat fuels are exempt from fuel taxes. Current excise taxes for gasoline and E85 are 18 and 9 cents per gallon, respectively.	10.6 for E85
Retail Tax Exemption		
Hawaii	Exempt from retail sale tax (4 percent). Expires Dec. 31, 2006	30 and 60 cents per gallon of ethanol, depending on non-tax portion of fuel retail price.
Illinois	2 percent sales tax exemption for E10. Expires June 30, 2003	10 to 15 cents per gallon of ethanol, depending on non-tax portion of

State Producer Incentives	
State	**Incentive**
Hawaii	Approximately 30 cents per gallon investment tax credit, $4.5 million maximum per plant. Credit is available on first 40 million gallons of production in the state prior to Jan. 1, 2012.
Minnesota	20 cents per gallon of ethanol. $30 million cap per year for total program. Expires 10 years after plant startup
Missouri	20 cents per gallon of ethanol produced in state, up to first 12.5 million gallons per plant. 5 cents per gallon for next 12.5 million gallons. Producer credit applies to first 6 years of plant production. Cap of $4.9 million.. Expires Dec. 31, 2007.
Montana	30 cents per gallon of ethanol, $3 million cap on a first-come basis, the ethanol must be produced from Montana-grown agricultural or wood products. Expires July 1, 2005.
Nebraska	7.5 cents per gallon of new capacity. Beginning in 2002, 20 cents per gallon production credit capped at $3.75 million annually and $25 million total per plant. Plants with less than 100,000 gallons of capacity can claim the credit for 84 months; plants with greater capacity, for 48 months. Other restrictions apply. For plants claiming the credit, an excise tax of 50 cents per dry ton of animal feed produced applies.
North Dakota	40 cents per gallon of ethanol produced and sold within North Dakota. Applies only to specific plants named in legislation.
Oklahoma	20 cents per gallon tax credit for 60 months through 2010. 125 million gallon cap per plant over 60 months.
South Dakota	20 cents per gallon of ethanol produced in state. $1 million per year per plant cap. $10 million total cap per plant.
Wisconsin	20 cents per gallon producer credit, capped at $3 million annually for all plants.
Wyoming	40 cents per gallon of ethanol. Program had $2 million per year cap. Wyoming grain purchase requirement. Expires July 1, 2003.

Estimated Amount for State Motor Fuel Excise Tax and Retail Sales Tax Exemptions for 2000				
State	**Cents per Gallon of Ethanol**	**Applicable Thousand Gallons**	**Dollars**	**Comment**
Alaska	60	1,184	710,400	All of applicable Alaska allocated to Anchorage
Connecticut	10	3,620	362,000	
Idaho	25	0	0	No ethanol used in state
Iowa	10	83,152	8,315,200	
South Dakota	20	20,814	4,162,800	
California	0	0	0	E85 only
Illinois	13	105,407	13,702,910	13 c/g estimated average, E10 only
Hawaii	30	0	0	No ethanol used in state
Total			**27,253,310**	

Estimated Amount for State producer Incentives for 2000			
State	**Incentive**	**Comment**	**Dollars**
Hawaii	Approximately 30 cents per gallon investment tax credit. $4.5 million maximum per plant.	No ethanol production	0
Minnesota	20 cents per gallon of ethanol. $30 million cap per year for the total program. Expires 10 years after plant startup	Estimated at program cap in 2000	30,000,000
Missouri	20 cents per gallon of ethanol produced in state, up to first 12.5 million gallons per plant. 5 cents per gallon for next 12.5 million gallons. Producer credit applies to first 6 years of plant production. Cap at $4.9 million.	No production in 2000. Several plants have been built since then. Cap limit may be changed by legislature.	0
Montana	30 cents per gallon of ethanol, $3 million cap on a first-come basis	No ethanol production	0
Nebraska	7.5 cents per gallon of new capacity. Beginning in 2002, 20 cents per gallon production credit, but offset from an excise tax on animal feed co-product. Restrictions apply.	Do not have estimate, applies to new capacity only in 2000. Nebraska estimates that the ethanol credits may total $1,372,500 in FY2001-02 and $4,500,000 in FY2002-03. This has to be offset by receipts from the excise tax on animal feed estimated at $830,000.	--
North Dakota	40 cents per gallon of ethanol produced and sold within North Dakota, applies only to specific plants named in legislation.	10 million gallons of capacity. Difficult to estimate.	2,000,000
Oklahoma	20 cents per gallon tax credit for 60 months through 2010. 125 million gallon cap per plant over 60 months.	No ethanol production	0
South Dakota	20 cents per gallon of ethanol produced in state. $1 million per year per plant cap. $10 million total cap per plant.	2 plants in 2000, but 5 more by 2002 either built or being built	2,000,000
Wisconsin	20 cents per gallon producer credit, capped at $3 million annually for all plants.	New capacity has come on line since 2000, program cap is $3,000,000	900,000
Wyoming	40 cents per gallon of ethanol. Program had $2 million per year cap. Wyoming grain purchase requirement.	5 million gallons of capacity, estimate at program max	2,000,000
Total			**34,900,000**